APPENDIX 10A. USER INSTRUCTIONS FOR SHIPMENTS AND NIA SPREADSHEETS

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10A.1 INTRODUCTION

The results obtained for the shipments analysis and the national impact analysis (NIA) can be examined and reproduced using the Microsoft Excel spreadsheet available on the U.S. Department of Energy Building Technologies website at: http://www.eere.energy.gov/buildings/appliance_standards/.

There are a total of five NIA spreadsheets, one each for the following products: dishwashers, dehumidifiers, cooktops and ovens, microwave ovens, and commercial clothes washers. The five spreadsheets posted on the DOE website represent the latest versions and have been tested with Microsoft Excel 2000.

To execute the spreadsheet requires Microsoft Excel 2000 or a later version. The NIA spreadsheet performs calculations to forecast the change in national energy use and net present value due to an energy efficiency standard. The energy use and associated costs for a given standard are determined first by calculating the shipments and then calculating the energy use and costs for all equipment shipped under that standard. The differences between the standards and base cases can then be compared and the overall energy savings and present values determined.

10A.1.1 Dishwashers

The dishwasher NIA spreadsheet or workbook consists of the following worksheets:

Input and Summary	Contains user input selections under "User Inputs" and a summary table, Cumulative Energy and Water Savings and NPV for the selected standard level efficiency distribution. The sheet contains the efficiency levels being considered for dishwashers and the associated incremental prices. This sheet also contains base and standards case efficiency trends for standard dishwashers, and efficiency weighted average energy use and equipment price for the base and standards cases.
Historical Shipment	Contains data for historical sales of dishwashers.
Base Case	This sheet mainly performs the calculations leading up to the estimation of shipments, energy and water consumption and operating cost calculations for the base case. The sheet starts with the stock accounting of the equipment and uses the survival function to calculate the surviving stock. It then performs calculations of replacements, and shipments going into new

housing. The sheet calculates replacement units, shipments going into new units and shipments going to first time owners, separately and aggregates them into total shipments.

Standards Case Contains stock accounting of the equipment that helps calculate annual shipments estimates, energy and water savings and operating cost savings for the standards case. The energy, water and cost savings in a single year are the difference between the base case energy use, water use and costs for that year and the standard case energy use, water use and costs in the same year.

Housing Projections Forecast sheet provides projected new housing construction starts and total housing stock.

Fuel and Water Prices This worksheet contains projected average energy and water prices for the three economic scenarios.

Heat Rates The sheet contains the marginal site to source conversion factors that are used in the source energy savings calculations, for both electricity and gas.

Lifetime This sheet contains the probability of survival of a dishwasher unit at a given age and the average lifetime of a unit.

10A.1.2 Dehumidifiers

The dehumidifier NIA spreadsheet or workbook consists of the following worksheets:

Input and Summary Contains user input selections under "User Inputs" and a summary table, Cumulative Energy Savings and NPV for the selected standard level efficiency distribution. The sheet contains the efficiency levels being considered for dehumidifiers and the associated incremental prices. This sheet also contains base and standards case efficiency trends for all the product classes, and efficiency weighted average energy use and equipment price for the base and standards cases for all the product classes.

Historical Shipment Contains data for historical sales of the equipment.

Base Case This sheet mainly performs the calculations leading up to the estimation of shipments, energy consumption and operating cost calculations for the base case. The sheet starts with the stock accounting of the equipment and uses the survival function to calculate the surviving stock. It then performs calculations of

replacements, and shipments going into new housing, thus yielding total shipments.

Standards Case Contains stock accounting of the equipment that helps calculate annual shipments estimates, energy savings and operating cost savings for the standards case. The energy and cost savings in a single year are the difference between the base case energy use and costs for that year and the standard case energy use and costs in the same year.

Housing Projections Forecast sheet provides projected new housing construction starts and stock.

Fuel Prices This worksheet contains projected average electricity prices for the three economic scenarios.

Heat Rates The sheet contains the marginal site to source conversion factors that are used in the source energy savings calculations.

Lifetime This sheet contains the probability of survival of a dehumidifier unit at a given age of the unit. The sheet also provides the average lifetime of a unit.

10A.1.3 Cooking Products

10A.1.3.1 Cooktops and Ovens

The cooktops and oven NIA spreadsheet or workbook consists of the following worksheets:

Summary Contains user input selections under “User Inputs” and summary tables, Cumulative Energy Savings and NPV for the all standard levels. The “User Inputs” contains two buttons “Recalculate” and “Show Charts”, which allow the user to select product category to perform the calculations for. Clicking on “Show Charts” allows the user to select a product class, and select a standard level for cooktops and oven. After the selection, clicking the “Recalculate” button will recalculate the results and set the default back on standard level 1.

Cooktop Base Case This sheet mainly performs the energy consumption and operating cost calculations for the cooktops base case. The sheet uses shipments estimate and UECs to perform the energy consumption calculations.

Cooktop Stds Case	This sheet performs the energy and operating cost savings calculations for the cooktops standards case. The energy and cost savings in a single year are the difference between the base case energy use and costs for that year and the standard case energy use and costs in the same year.
Oven Base Case	This sheet mainly performs the energy consumption and operating cost calculations for the ovens base case. The sheet uses shipments estimate and UECs to perform the energy consumption calculations.
Oven Stds Case	This sheet performs the energy and operating cost savings calculations for the ovens standards case. The energy and cost savings in a single year are the difference between the base case energy use and costs for that year and the standard case energy use and costs in the same year.
Efficiency and Price	This sheet provides the efficiency and price data for all product classes.
Base Case Shipment Gas Cooking	This sheet contains the main shipments model for gas cooking and provides the shipments estimates for gas cooking. The sheet further disaggregates the gas cooking shipments into shipments attributable to product classes for both cooktops and oven, based on their market shares.
Base Case Shipment Elec Cooking	This sheet contains the main shipments model for electric cooking and provides the shipments estimates for gas cooking. The sheet further disaggregates shipments for electric cooking into shipments attributable to product classes for both cooktops and oven, based on their market shares.
Base Case Ship Charts	This sheet provides the details of shipments estimates in the form of a chart.
New Saturation	This sheet provides product saturation in new homes. The saturations are provided by product class.
Historical Shipment	Contains data for historical sales of the equipment.
Housing Projections	Contains Forecast sheet provides projected new housing construction starts and stock.
Fuel Prices	This worksheet contains projected average electricity and gas prices for the three economic scenarios.

Heat Rates	The sheet contains the marginal site to source conversion factors that are used in the source energy savings calculations, for both electricity and gas.
Lifetime	This sheet contains the probability of survival for a given age of the equipment.

10A.1.3.2 Microwave Ovens

The microwave oven NIA spreadsheet or workbook consists of the following worksheets:

Input and Summary	Contains user input selections under "User Inputs" and a summary table, Cumulative Energy and Water Savings and NPV for the selected standard level efficiency distribution. The sheet contains the efficiency levels being considered for commercial clothes washers and the associated incremental prices. This sheet also contains base and standards case efficiency trends, and efficiency weighted average energy use and equipment price for the base and standards cases.
Historical Shipment Base Case	Contains data for historical sales of commercial clothes washers. This sheet mainly performs the calculations leading up to the estimation of shipments, energy and water consumption and operating cost calculations for the base case. The sheet starts with the stock accounting of the equipment and uses the survival function to calculate the surviving stock. It then performs calculations of replacements, and shipments due to new multi-family housing. The sheet calculates replacement units and shipments resulting from new construction separately and aggregates them into total shipments.
Standards Case	Contains stock accounting of the equipment that helps calculate annual shipments estimates, energy and water savings and operating cost savings for the standards case. The energy, water and cost savings in a single year are the difference between the base case energy use, water use and costs for that year and the standard case energy use, water use and costs in the same year.
Housing Projections	Forecast sheet provides projected new housing construction starts in multi-family housing.
Fuel and Water Prices	This worksheet contains projected average energy and water prices for the three economic scenarios.

Heat Rates The sheet contains the marginal site to source conversion factors that are used in the source energy savings calculations, for both electricity and gas.

Lifetime This sheet contains the probability of survival of a clothes washer unit at a given age and the average lifetime of a unit.

10A.1.4 Commercial Clothes Washers

The commercial clothes washer NIA spreadsheet or workbook consists of the following worksheets:

Input and Summary Contains user input selections under "User Inputs" and a summary table, Cumulative Energy Savings and NPV for the selected standard level efficiency distribution. The sheet contains the efficiency levels being considered for microwave ovens and the associated incremental prices. This sheet also contains base and standards case efficiency trends, and efficiency weighted average energy use and equipment price for the base and standards cases for all the product classes.

Historical Shipment Contains data for historical sales of the equipment.

Base Case This sheet mainly performs the calculations leading up to the estimation of shipments, energy consumption and operating cost calculations for the base case. The sheet starts with the stock accounting of the equipment and uses the survival function to calculate the surviving stock. It then performs calculations of replacements, and shipments going into new housing, thus yielding total shipments.

Standards Case Contains stock accounting of the equipment that helps calculate annual shipments estimates, energy savings and operating cost savings for the standards case. The energy and cost savings in a single year are the difference between the base case energy use and costs for that year and the standard case energy use and costs in the same year.

Housing Projections Forecast sheet provides projected new housing construction starts and stock.

Fuel Prices This worksheet contains projected average electricity prices for the three economic scenarios.

Heat Rates The sheet contains the marginal site to source conversion factors that are used in the source energy savings calculations.

Lifetime This sheet contains the probability of survival of a microwave oven unit at a given age of the unit. The sheet also provides the average lifetime of a unit.

10A.2 BASIC INSTRUCTIONS

Basic instructions for operating the NIA spreadsheets are as follows:

1. Once the NIA spreadsheets have been downloaded from the Web, open the file using Excel. At the bottom, click on the tab for the worksheet Input and Summary.

2. Use Excel's View/Zoom commands at the top menu bar to change the size of the display to make it fit your monitor.

3. The user can change the model parameters listed in the grey box labelled "User Inputs". The parameters are:
    a. Economic Growth: To the change value, use the drop-down arrow and select the desired Growth level (Reference, Low, or High).
    b. Discount Rate: To the change value, type in the desired Discount Rate.
    c. Relative Price Elasticity: To change value, use the drop-down arrow and select the desired impact (this parameter is not considered in the cooking products analysis).
    d. Lifetime: To change value, type in the desired value that lies within the maximum lifetime indicated.

4. Once the parameters have been set, click the "Set base case/Standards Case" button and define the efficiency distribution of the market, and the efficiency growth rate for both the base case and the standards case.

5. Once the distribution and the growth rate have been set, click the "update" button to make your defined distribution effective.

6. The results are automatically updated and are reported in the summary table for each product class to the right of the "User Inputs" box.